Overview

• Binary Trees
• Quicksort

• Removal of a non-root node from a heap
Consider removing the node with the key 29 from the following heap.

Removal Of A Non-Root Node From A Heap
Quick Sort

- The following diagram illustrates one step.

Quick Sort is a hard-split, easy-join method.
Thus, in this case, Quick Sort takes $O(n \log n)$ steps.

quick sort (cont.)
In this case, Quick Sort takes $O(n \log n)$ steps.

On the other hand, an unfortunate choice of the pivot could divide the array into two parts, one that contains no elements and another that contains $n - 1$ elements.

Quick Sort (cont.)
can be quite common in some applications. used in practice, since it behaves well on the nearly-sorted case, which

- Take the median of the first, last, and middle elements. This is often
  an inverse-sorted array.

- Pick the first element (worst-case scenario is a nearly-sorted or nearly-
  perfect).

- Various strategies are used to choose the pivot. (None is perfect.)

Quick Sort (cont.)